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APPELLANTS' BRIEF Address to: Mail Stop Appeal Brief-Patents Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	Application Number	10/806,829
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	First Named Inventor	Bai, Jian
	Examiner	WELLS, NIKITA
	Group Art	2881
	Title: *Ambient Pressure Matrix-Assisted Laser Desorption/Ionization (Maldi) Apparatus and Method of Analysis*	

Sir:

This Brief is filed in support of Appellants' appeal of the rejection set forth in the Office Action dated June 25, 2010. A Notice of Appeal was filed on September 21, 2010 making this Brief due by November 21, 2010. Accordingly, this Appeal Brief is timely filed.

The Board of Appeals and Interferences has jurisdiction over this appeal pursuant to 35 U.S.C. §134(a).

The Commissioner is hereby authorized to charge deposit account number 50-1078 reference no. 10980322-04-US to cover any required fee for filing the Appellants' brief. Additionally, in the unlikely event that the fee transmittal or other papers are separated from this document and/or other fees or relief are required, Appellants petition for such relief, including extensions of time, and authorize the Commissioner to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.21 which may be required by this paper, or to credit any overpayment, to the above disclosed account.

TABLE OF CONTENTS

CONTENTS PAGE

Real Party in Interest 3
Related Appeals and Interferences 3
Status of Claims 3
Status of Amendments 3
Summary of Claimed Subject Matter 3
Grounds of Rejection to be Reviewed on Appeal 4
Argument 4
Claims Appendix 17
Evidence Appendix 25
Related Proceedings Appendix 26

REAL PARTY IN INTEREST

The inventors named on this patent application assigned their entire rights to the invention to Agilent Technologies, Inc.

RELATED APPEALS AND INTERFERENCES

There are currently no other appeals or interferences known to Appellants, the undersigned Appellants' representative, or the assignee to whom the inventors assigned their rights in the instant case, which would directly affect or be directly affected by, or have a bearing on the Board's decision in the instant appeal.

STATUS OF CLAIMS

Claims 34-80 are pending. Claims 1-33 are cancelled.

Claims 34-80 stand rejected and are appealed herein.

STATUS OF AMENDMENTS

No amendments to the claims were filed subsequent to issuance of the Final Rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

The claims generally relate to a method by which analytes in a sample are ionized by a process called "MALDI", and an apparatus for performing the same. In very general terms, a solution that contains the analyte and a matrix (which is often a solvent) is irradiated by a laser. Energy from the laser is absorbed by the matrix, and charge transfer from the matrix to the analyte causes ionization of the analyte.

MALDI is often performed on the eluate of a chromatography apparatus. In such methods, the matrix may be added to the solution after it has exited the apparatus (i.e., the MALDI method may be performed with additional matrix added to the analyte solution). Alternatively, the matrix may already be present in the analyte solution during chromatography, in which case the MALDI method may be performed "without additional matrix added to the analyte solution".

A description of each independent appealed claim and where support for each can be found in the specification is set forth below.

Claim 34 recites a method for mass spectroscopic analysis of an analyte solution, comprising: irradiating a liquid volume of the analyte solution, without additional matrix added to the analyte solution, with a light beam to desorb solution-specific ions into a surrounding gas to produce gas-phase ions (p. 13 lines 16-17; p. 12 lines 6-10); transferring the gas-phase ions to a mass analyzer (p. 13 lines 17-20); and mass-analyzing the gas-phase ions by the mass analyzer (p. 16 lines 1-9).

Claim 51 recites a system for the mass spectroscopic analysis of an analyte solution, comprising: means for irradiating a liquid volume of the analyte solution, without additional matrix added to the analyte solution, to desorb solution-specific ions into a surrounding gas to produce gas-phase ions (p. 13 lines 16-17; p. 12 lines 6-10); means for mass-analyzing the gas-phase ions (p. 16 lines 1-9); and means for transferring the gas-phase ions into the means for mass-analyzing (p. 16 lines 1-9).

Claim 65 recites an apparatus for the mass spectroscopic analysis of an analyte solution, comprising: a light source configured to irradiate a liquid volume of the analyte solution, without additional matrix added to the analyte solution, to desorb solution-specific ions into a surrounding gas to produce gas-phase ions (p. 13 lines 16-17; p. 12 lines 6-10); a mass analyzer configured to mass-analyze the gas-phase ions; and means to transfer the gas-phase ions to the mass analyzer (p. 16 lines 1-9).

Appellants note that the claims of the instant application are copied from U.S. patent 6,683,300 in order to provoke an interference.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 34-80 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which is most nearly connected, to make and/or use the invention.

ARGUMENT

Claims 34-80 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which is most nearly

connected, to make and/or use the invention.

As will be discussed in greater detail below, issue is one of whether the instant specification describes performing the claimed method using a liquid volume of an analyte solution "without additional matrix added to said analyte solution".

In the discussion that follows below, the "without additional matrix added to said analyte solution" element may be referred to as the "without additional matrix" limitation for convenience.

The rejection is based on the assertion that there is no written description of a method that is performed "without additional matrix"

In making this rejection, the Examiner states: "With respect to the independent claims 34, 51, and 65, the key element of these claims being: …irradiating a liquid volume of said analyte selection, without additional matrix added to said analyte solution" has not been found in the Specification of this Application (10/806,829), in the Patent Application (09/146,817)(now US Patent 6,849,847), or the Provisional Application (60/089,088)." OA, page 3.

The Examiner also states: "after thorough examination of the newly presented RCE, Response, and Declaration, it was determined that the subject matter as presented in the claims is not described in the specification." OA, page 2. The Examiner goes on to state (with reference to the "without additional matrix" element) that "The key element……is missing from the Specification of the applicant's application." OA, page 2.

Based on the above, the issue is one of whether the instant specification describes performing the claimed method using a liquid volume of an analyte solution "without additional matrix". The rejection is one of enablement, but the sole source of the rejection is one of whether there is a written description of a method that is performed "without additional matrix".

The Applicants note that this rejection was first made in the Office Action of February 25, 2009, and the rejection was fully addressed in the August 25, 2009. *There is no rebuttal of the Applicants' prior arguments in the Office Action of June 25, 2010.*

Principles of law relating to negative limitations

It is well settled that the examiner has the burden of making out a *prima facie* case that the appealed claims do not comply with § 112, first paragraph, written description requirement, by setting forth evidence or reasons why, as a matter of fact, the written description in appellant's disclosure would not reasonably convey to persons skilled in this art that appellant was in possession of the invention defined by the claims, including all of the limitations thereof, at the time the application was filed. *See generally, In re Alton, 76 F.3d 1168, 1172, 1175-76, 37 USPQ2d 1578, 1581, 1583-84 (Fed. Cir. 1996),* citing *In re Wertheim, 541 F.2d 257, 262-64, 191 USPQ 90, 96-97 (CCPA 1976).* It is further well settled that while the written description does not have to describe the invention later claimed *in haec verba,* such written description "must . . . convey with reasonable clarity to those skilled in the art that . . . [appellant] was in possession *of the invention . . . now claimed." Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991); see also Purdue Pharma L.P. v. Faulding Inc., 230 F.3d 1320, 1323, 56 USPQ2d 1481, 1483 (Fed. Cir. 2000); Wertheim, 541 F.2d at 262-65, 191 USPQ at 96-98.* Thus, where "the specification contains a description of the claimed invention, albeit not *in ipsis verbis* (in the identical words), then the examiner or the Board, in order to meet the burden of proof, must provide reasons why one of ordinary skill in the art would not consider the description sufficient." *Alton 76 F.3d at 1175-76, 37 USPQ2d at 1583.* A negative limitation which does not appear in the written description of the specification as filed would cause the claim to violate the written description requirement of § 112, first paragraph, if it introduces new concepts. *See Ex parte Grasselli, 231 USPQ 393 (Bd. App. 1983), aff'd mem., 738 F.2d 453 (Fed. Cir 1984),* citing *In re Anderson, 471 F.2d 1237, 1 76 USPQ 331 (CCPA 1973).*

Applicants note that the BPAI has addressed written description support of negative limitations in a number of decisions, e.g., Ex parte Briant (2003; Appeal No. 2003-2130), Ex parte Burns (2010; Appeal No. 2009-011778) and Ex parte Parks (1993; Appeal No. 1993-2740). The rejections were reversed in all three of these decisions.

The fact pattern of the instant case is very similar to that of *Ex part Parks* in that: a) there is no *in haec verba* support for the negative limitation in question in the

application; b) there is no mention of the thing being added in the examples (in the case of Parks it is a catalyst, in the instant case it is a additional matrix) and c) there is an unchallenged Declaration that concludes that the application describes a method that is performed in the absence of a material. The Ex parte Parks decision is provided herewith.

Several *independent* arguments are set forth below.

The Examiner has not met his burden in showing that the specification does not describe a method that is performed "without additional matrix"

The specification affirmatively describes a method in which additional matrix can be used (see, e.g., page 12, lines 25-27: "For sample preparation, the analyte…may be deposited on top of a matrix layer", and page 16 line 29: "the matrix/sample mix" etc.). The relevant section at page 12, lines 25-27, is pasted below:

> For sample preparation, the analyte may be co-crystallized with the matrix, embedded in a layer of matrix material on a solid support, or may be deposited on top of a matrix layer. The solution containing the dissolved analyte and matrix is applied to a probe

However, at no point does the instant application state that additional matrix is in any way essential, required or in any way critical for performing the method.

Since the Examiner has offered no explanation, evidence or reason as to why he believes that the specification is so limited and, as such, has not met his burden in making this rejection.

This rejection should be withdrawn for this reason. However, to the extent that any further discussion is necessary, the Board is respectfully referred to the following supplemental arguments.

An element that is positively recited in the specification may be explicitly excluded in the claims

According to *In re Johnson*[1] an element that is positively recited in the specification may be explicitly excluded in the claims.

As noted above, the specification affirmatively describes a method in which

additional matrix can be used in the method (see, e.g., page 12, lines 25-27: "For sample preparation, the analyte…may be deposited on top of a matrix layer", and page 16 line 29: "the matrix/sample mix" etc.).

Page 12, lines 25-27, is pasted below:

> For sample preparation, the analyte may be co-crystallized with the matrix, embedded in a layer of matrix material on a solid support, or may be deposited on top of a matrix layer. The solution containing the dissolved analyte and matrix is applied to a probe

Consistent with *In re Johnson*, because the specification describes a method in which additional matrix may be used, there is support in the specification for excluding that element (i.e., excluding the use of "additional matrix") from the claims.

Applicants respectfully request reversal of this rejection based on this discussion.

One of the experiments described in the Examples section makes no mention of additional matrix

The experiment described in the specification at page 17, lines 12-15 makes no mention of additional matrix. This example set forth below:

> Figures 6A and 6B show ambient pressure MALDI data of a tryptic digest of bovine cytochrome c (14 pmoles deposited on a sample stage). Figure 6A shows the total ion chromatogram (TIC) as the laser was moved across the sample spot. Figure 6B shows 1.25 seconds averaged scan (m/z 300-1700) acquiring data every 250 milliseconds.

The experiment described above is in contrast to the experiment described at page 16 lines 24 to 39, in which addition matrix (α-cyano-4-hydroxycinnamic acid) was added. This section is pasted below:

> (matrix: *α-cyano-4-hydroxycinnamic acid; analyte bradykinin)*
>
> As shown in Figure 2, an AP-MALDI source was constructed from a sample stage made from a sheet of metal and held at ground potential. The sample stage was positioned approximately 5 mm opposite an atmospheric ion sampling capillary held at high voltage potential (4 kV). A focused nitrogen laser of wavelength 337 nm was directed and fired at a rate of 20 Hz at a dried spot of a matrix/sample mix on the sample stage, ionizing the matrix/sample mix.

Since the Examples section of the application clearly describes an experiment

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1 *In re Johnson* 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977)

in which the claimed method "without additional matrix", the Applicants submit that this element of the claimed method is clearly described in the application.

The Board's earlier decision in *Ex parte Parks* is relevant here because, in that case, the fact that there was no mention of a catalyst in the examples was sufficient to provide to exclude a catalyst from the claims. The facts of this instant case are not dis-similar to those of *Ex parte Parks*.

Applicants respectfully request reversal of this rejection based on this discussion.

The specification uses the phrase "may be" when discussing the use of additional matrix

One section of the specification that discusses the use of additional matrix (page 12, lines 25-27) is set forth below with underlining added:

> For sample preparation, the analyte may be co-crystallized with the matrix, embedded in a layer of matrix material on a solid support, or may be deposited on top of a matrix layer. The solution containing the dissolved analyte and matrix is applied to a probe

Since the phrase "may be" is used above, it is clear that the use of additional matrix is optional and other embodiments may not use additional matrix. Since those other embodiments would be done "without additional matrix", the Applicants submit that this element of the claimed method is clearly described in the application.

Applicants respectfully request reversal of this rejection based on this discussion.

Applicants have filed an unrebutted Declaration by Steven M. Fischer

On August 25, 2009, Applicants filed a Declaration by Steven M. Fischer, who describes in great detail why the specification of the instant application describes a method in which: a) the claimed method is performed directly on the effluent from a chromatography apparatus, without the additional matrix; and b) the application states that water, which is a common solvent for chromatography, can be used as a matrix; and c) the application describes the use of a laser at a wavelength appropriate for a solvent in an analyte solution.

As the Board no doubt knows, under the case law and its own rules of

practice, the Office is required to consider the factual evidence in the record, including the Fischer Declaration and its factual underpinnings, and either accept them as true or rebut them with a factual showing of its own. *In re Alton*, 76 F.3d 1168, 1175, 37 U.S.P.Q.2d (BNA) 1578, 1583 (Fed. Cir. 1996). In this case, the Examiner has provided no rebuttal of either the findings or the conclusion presented by Mr. Fischer in his declaration.

The Declaration by Steven M. Fischer is provided herewith as an exhibit. The declaration of Steven M. Fischer is believed to establishes that one of ordinary skill in the art would understand that the present specification discloses the step of irradiating a liquid volume of analyte solution "without additional matrix added to said analyte solution."

Applicants respectfully request reversal of this rejection based on this discussion.

Supplemental arguments

To the extent that further discussion is necessary, the Board is directed to the following arguments that were made in the Applicants response of August 25, 2009. As noted above, these arguments are unrebutted.

This written description that supports this claim element includes those portions of the present specification that describe performing MALDI directly on a sample analyte in solution by choosing a laser specifically for the solution containing the analyte such that ionization of the analyte occurs by direct charge transfer from the irradiated solution to the analyte. Under such circumstances, "no additional matrix" is necessary or desirable.

A. The Present Specification Describes The Combination Of A Chromatography Apparatus And A Mass Spectrometer Such That A Liquid Analyte Solution Is Irradiated To Yield Ionized Analyte Without The Necessity Of Additional Matrix.

The disclosure of the present specification describes the irradiation of a liquid volume of analyte solution without additional matrix to the extent necessary for one of ordinary skill in the art to understand that the inventors were in possession of this subject matter. The following excerpts from the specification clearly describe the

absence of "additional matrix" added to said analyte solution:

> "Flowing" refers to a liquid sample or matrix which is moving and from which the sample and matrix is analyzed.
>
> (See specification page 10, lines 20 – 21 and here after "Spec 10:20 – 21")
>
> "Holder" also refers to an interface for introducing a moving liquid e.g. the effluent from a HPLC or CE a syringe pump and the like.

(Spec 10:25-27)

> The analyte matrix may be a liquid such as water or alcohol e.g. methanol, or a solid such as ice.

(Spec 13:2–3)

> The sampling may occur using a static or a flowing liquid sample, such as the effluent from an HPLC, CE, or syringe pump.
>
> (Spec 13:8-10)

These examples disclose both that the liquid undergoing chromatographic separation contains the analytes, and that the liquid is the matrix. No requirement for any added matrix exists and none is described.

Thus, when the present specification discloses irradiation of a flowing liquid solution containing analyte, the specification is describing an analyte solution without added matrix because the solution transfers charge to (or from) an analyte, and thereby acts as the matrix.

B. To One of Ordinary Skill In the Art, The Definition Of "Matrix" As a Liquid and The Pairing of the Liquid Matrix to the Laser Wavelength to Achieve Charge Transfer Is Also a Written Desciption Of Irradiating Liquid Solution Containing Analyte Without "Additional Matrix."

1 The express language of the specification describes the liquid as the matrix element at issue.

The present specification does not require that any matrix be added to the analyte solution. The present specification defines "matrix" as:

> ""Matrix" refers to any solid or liquid molecules having the ability to transfer or receive a charge from the analyte and an absorption of the wave length of the laser ….

* * *

> For an infrared laser, aliphatic organic compounds, hydrocarbons, aliphatic organic compounds which contain heteroatoms such as oxygen nitrogen, sulfur, and combinations thereof, water and combinations of these compounds which can transfer to or receive a charge from the analyte are suitable. (Spec. 11:1-8) (emphasis added)

Thus, the express definition of "Matrix" in the specification conveys to one skilled in the art that molecules of the liquid solution cause charge transfer that ionizes the analyte in solution without the need for any "additional matrix."

2 The disclosure of a liquid solution at atmospheric pressure also demonstrates to one of ordinary skill that no additional matrix is needed.

In addition to the plain text of the specification, the entire content of the specification is the disclosure of the novelty of AP MALDI compared to the prior art vacuum MALDI. As note above, one of the advantages is the ability to physically attach a mass spectrometer to a chromatography apparatus so that analytes can be chromotographically separated and analyzed in a mass spectrometer.

Accordingly, the specification would be read by one of ordinary skill as disclosing that one of the many advantages of AP MALDI is advantageous analyte preparation, and specifically, that the use of a chromatography solvent as the matrix-charge transfer agent means that the irradiation and charge transfer processes take place in the solvent and thus does not require any "added matrix."

Furthermore, the present application discloses the specific and selective pairing of the laser wavelength to the liquid such that the analyte solvent acts as the matrix and thereby describes performing the irradiation in a solution "without additional matrix." The specification states.

> "Matrix" refers to any solid or liquid molecules having the ability to transfer or receive a charge from the analyte and an absorption at the wavelength of the laser, such as ultraviolet (UV), (electronic), visible (VIS) or infrared (IR) (vibrational and/or rotational) or combinations thereof. For an ultraviolet laser, substituted aromatic compounds are used which can transfer or receive a change to or from the analyte. For an infrared laser, aliphatic organic compounds, hydrocarbons, aliphatic organic compounds which contain heteroatoms such as oxygen, nitrogen, sulfur, and combinations thereof, water and combinations of these compounds which can transfer to or receive a charge from the analyte are suitable. (Specification ____:_____)

Water is the predominant chromatography solvent used in the art and it is specifically disclosed in the present specification as a "matrix." By selecting the wavelength of the laser to be suitable for the solvent, no additional matrix is needed.

Accordingly, a description of the direct ionization of analyte in solution is a written description of the element at issue and the present specification meets the written description requirement of §112. Therefore, to one skilled in the art, the present specification describes the absence of added matrix by disclosing the step of irradiating the analyte in the liquid sample with a laser paired to the solvent and the claimed step of "irradiating a liquid volume of said analyte solution, without additional matrix added to said analyte solution" is adequately described under §112.

C. The Present Specification Satisfies the Legal Standard Governing the Written Description Requirement of §112 for the Step of Irradiating a Liquid Analyte Solution Without Additional Matrix.

As noted above, the specification describes an analyte solution without additional matrix because: first, the specification discloses that the analyte contained in solution can be ionized by irradiating the solution itself and that where the analyte is ionized directly by the solution, no additional matrix is used; and second, the specification expressly defines the solution containing the analyte as a "matrix" that facilitates ionization of the analytes in the solution.

1. The negative limitation "without additional matrix" need not be written verbation in the specification – a description of irradiation of a liquid solution containing analyte under condition to create change transfer is sufficient.

The law does not require that the terms "without additional matrix" appear verbatim in the specification. The purpose of the written description requirement is to confirm that the inventor "possesses" the invention as of the time of the application. In re Johnson, 558 F.2d 1008, 1018 (CCPA 1977). The proper focus of the inquiry is whether the specification adequately supplies formulas, charts, diagrams or any other material from which one skilled in the art can ascertain that the inventor "possessed," or invented, the subject matter of the claim. As the court held in In re Smith, 481 F.2d 910 (CCPA 1973):

> The specification as originally filed must convey clearly to those skilled in the art information that the applicant has invented the subject matter later claimed. [Citations omitted] When the original specification accomplishes that, regardless of how it accomplishes it, the essential goal of the description requirement is realized.

"The written description requirement is satisfied by the patentee's disclosure of 'such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention.'" Crown Operations International Ltd. V. Solutia Inc., 289 F.3d 1367, 1376 (Fed. Cir. 2002).

The present specification makes clear at least the following beyond dispute" 1) the analyte may be contained in a liquid that functions as the matrix to perform the change transfer function; 2) the laser wavelength is matched to the analyte solvent so that the solvent functions as the matrix; 3) the AP MALDI technique can be applied to flowing analyte in solution and at atmospheric pressure without adding matrix; and 4) the direct coupling of a chromatography apparatus and mass spectrometer enables mass analysis without the additional analyte/sample process where additional matrix would be used. Thus, the present specification supports the claim limitation at issue.

D. The Written Description of the Element at Issue in the '300 Patent Is Essentially the Same as the Present Specification.

Applicants submit that support in the '300 patent, under the written description requirement of §112, is almost identical to the present specification. In both cases, neither the present specification nor the '300 patent has a verbatim recitation of the phrase "without additional matrix. . . " Instead, each claims this element based on the same method of irradiating analyte in liquid solution with the need for an additional matrix in addition to the analyte solution.

> The method and system include the steps of or means for irradiating a liquid volume of the analyte solution with a light beam resulting in desorption of solution-specific ions into a surrounding gas to produce gas-phase ions, transferring the gas-phrase ions to a mass, and mass-analyzing the gas-phase according to a mass to charge ratio.
>
> '300 Patent, col. 4, lines 55 – 61

Ambient pressure ionization is achieved by irradiating the aqueous solutions with a pulsed laser at an absorption wavelength of the solution.

Id. at col. 5, lines 4 – 6

In accordance with the present invention, ions are produced at or about atmospheric pressure directly from an analyte solution which is deposited as a droplet from an atop of a solid target plate.

Id. at col. 5, lines 13 – 16

The analyte solution can include water, organic fluids, inorganic fluids, or a mixture thereof. The analyte solution can include solutions or organic and inorganic compounds including at least one of peptides, proteins, nucleic acids, polymers, drugs, and other compounds of biological, medical or industrial significance.

Id. at col. 6, lines 1 – 6

According to the present invention, the AP LADI method can be used for MS analyses of other liquid solutions such as the common analyte solutions previously discussed. The droplet size, laser pulse energy, and target plate material and/or coating are adjusted according to the present invention to optimize ionization efficiency for the type of solvent employed.

Id. at col.11, lines 4 – 9

The mass spectrometer interface according to the present invention can be modified so that a continuous flow of a liquid solution (e.g., from a high pressure liquid chromatography HPLC or capillary electrophoresis CE) is supplied directly to the laser spot position.

Id. at col. 11, lines 31 – 35 (emphasis added)

A liquid solution 38 that is to be mass-analyzed is supplied through a capillary transfer tube 37, connected at one end to a liquid pump such as for example a syringe pump, a liquid chromatography instrument pump, an output of capillary zone electrophoresis installation, or any other device that can provide a liquid analyte solution flow.

Id. at col. 11, lines 46 – 52

These examples show that the terms "without additional matrix added to said analyte solution" element in the '300 patent are supported by essentially the same written description as in the present specification. Thus, the written description support that permitted issuance of the '300 patent is virtually identical to the present specification. In both cases, the specification describes irradiation of analyte solution and the production of ions directly from the analyte solution. Therefore, the disclosure of this element in the present specification must be adequate to comply with written description requirement of §112.

In view of the foregoing discussion, the Appellants contend that this rejection may be reversed, and that the application be remanded to the Examiner with instructions to issue a Notice of Allowance.

Respectfully submitted,

Date: November 19, 2010

By: /David C. Scherer, Reg. No. 56,993/
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CLAIMS APPENDIX

34. A method for mass spectroscopic analysis of an analyte solution, comprising:

irradiating a liquid volume of said analyte solution, without additional matrix added to said analyte solution, with a light beam to desorb solution-specific ions into a surrounding gas to produce gas-phase ions;

transferring said gas-phase ions to a mass analyzer; and

mass-analyzing said gas-phase ions by said mass analyzer.

35. The method as in claim 34, wherein the step of irradiating with a light beam comprises:

irradiating with a laser beam.

36. The method as in claim 35, wherein the step of irradiating with a laser beam comprises:

pulsing with a laser beam.

37. The method as in claim 36, wherein the step of irradiating comprises:

producing said gas-phase ions at or about atmospheric pressures.

38. The method as in claim 34, wherein the step of transferring comprises:

transferring said gas-phase ions to an inlet port of a mass spectrometer

equipped with an atmospheric pressure interface.

39. The method as in claim 34, further comprising:

depositing said analyte solution on a surface, prior to the step of irradiating.

40. The method as in claim 39, wherein the step of depositing comprises:

depositing a matrix-free analyte solution.

41. The method as in claim 38, wherein said step of depositing comprises:

depositing said analyte solution on at least one of metal surface, and a membrane.

42. The method as in claim 34, wherein said analyte solution is in an electrophoresis gel.

43. The method as in claim 39, wherein said step of depositing comprises:

depositing said analyte solution on a flat surface.

44. The method as in claim 39, wherein said step of depositing comprises:

depositing samples of multiple analyte solutions on an array.

45. The method as in claim 34, wherein said step of transferring comprises:

placing said analyte solution close to at least one of an inlet port of said mass analyzer and an inlet orifice attached to said inlet port.

46. The method as in claim 34, wherein said step of transferring comprises:

generating an electric field between said analyte solution and at least one of an inlet port of said mass analyzer and an inlet orifice attached to said inlet port to assist in transfer of said gas-phase ions into the mass analyzer.

47. The method as in claim 34, wherein said step of transferring comprises:

producing a gas flow to transfer said gas-phase ions toward at least one of an inlet port of said mass analyzer and an inlet orifice attached to said inlet port.

48. The method as in claim 34, wherein said step of mass-analyzing comprises:

analyzing liquid solutions of organic and inorganic compounds including peptides, proteins, nucleic acids, polymers and other compounds of biological significance.

49. The method as in claim 34, wherein said step of irradiating comprises:

irradiating said analyte solution at a wavelength which is absorbed by said

analyte solution.

50. The method as in claim 39, further comprising:

providing a liquid flow of said analyte solution to said surface.

51. A system for the mass spectroscopic analysis of an analyte solution, comprising:

means for irradiating a liquid volume of said analyte solution, without additional matrix added to said analyte solution, to desorb solution-specific ions into a surrounding gas to produce gas-phase ions;

means for mass-analyzing said gas-phase ions; and

means for transferring said gas-phase ions into said means for mass-analyzing.

52. The system as in claim 51, further comprising:

means for depositing said analyte solution on a surface.

53. The system as in claim 52, wherein said means for depositing is configured to deposit a matrix-free analyte solution.

54. The system as in claim 52, wherein said surface comprises:

at least one of a metal surface and a membrane.

55. The system as in claim 52, wherein said surface comprises an

electrophoresis gel.

56. The system as in claim 52, wherein said surface comprises an array of multiple analyte solutions.

57. The system as in claim 51, wherein said means for transferring comprises:

an electric field between said analyte solution and an inlet of said means for mass analyzing to assist in transfer of said gas-phase ions into the means for mass analyzing.

58. The system as in claim 51, wherein said means for irradiating a surface comprises:

means for irradiating at a wavelength which is absorbed by said analyte solution.

59. The system as in claim 51, wherein said means for irradiating comprises:

means for pulsing an infrared laser light.

60. The system as in claim 52, further comprising:

means for providing a liquid flow of said analyte solution to said surface.

61. The system as in claim 54, wherein said means for providing comprises:

means for moving said surface.

62. The system as in claim 54, wherein said means of providing comprises:

means for moving said surface relative to said means for mass analyzing.

63. The system as in claim 54, wherein said means for providing comprises:

means for providing a continuous flow of the analyte solution.

64. The system as in claim 51, wherein said means for transferring comprises:

an enclosure with a gas under defined pressure and temperature conditions.

65. An apparatus for the mass spectroscopic analysis of an analyte solution, comprising:

a light source configured to irradiate a liquid volume of said analyte solution, without additional matrix added to said analyte solution, to desorb solution-specific ions into a surrounding gas to produce gas-phase ions;

a mass analyzer configured to mass-analyze said gas-phase ions; and means to transfer said gas-phase ions to said mass analyzer.

66. The apparatus as in claim 65, wherein the light source comprises a laser beam.

67. The apparatus as in claim 66. wherein the laser beam is configured to generate a pulsed laser beam.

68. The apparatus as in claim 65, wherein said gas-phase ions are produced at or about atmospheric pressures.

69. The apparatus as in claim 65, wherein the transfer mechanism includes an inlet port on a mass spectrometer equipped with an atmospheric pressure interface.

70. The apparatus as in claim 65, further comprising:

a substrate configured to receive said analyte solution.

71. The apparatus as in claim 70, wherein said surface comprises:

at least one of a metal surface and a membrane.

72. The apparatus as in claim 70, wherein said surface comprises an electrophoresis gel.

73. The apparatus as in claim 70, wherein said surface comprises:

an array with multiple analyte solutions.

74. The apparatus as in claim 65, wherein said mass analyzer comprises:

at least one of an inlet orifice attached to an inlet port of a mass spectrometer and a capillary tube attached to said inlet port.

75. The apparatus as in claim 65, wherein the transfer means comprises:

an electric field between said analyte solution and at least one of an inlet port and a capillary tube attached to said inlet port.

76. The apparatus as in claim 65, wherein the analyte solution comprises:

a liquid solution including at least one of peptides, proteins, nucleic acids, polymers and other compounds of biological industrial significance.

77. The apparatus as in claim 65, wherein said light source is configured to irradiate said analyte solution with laser pulses at a wavelength which is absorbed by the analyte solution.

78. The apparatus as in claim 65, further comprising a high-performance liquid chromatograph or a CE.

79. The apparatus as in claim 65, further comprising:

an enclosure filled with a gas under atmospheric pressure.

80. The apparatus as in claim 65, wherein said analyte solution comprises:

a matrix-free analyte solution.

EVIDENCE APPENDIX

The Declaration of Steven M. Fischer filed under 37 C.F.R. 1.132 on November 17, 2008 is provided herein.

Ex parte Parks (1993; Appeal No. 1993-2740) is provided herein.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	10/806,829	Confirmation No.:	4240
Applicant	:	Jian Bai, Steven M. Fischer and J. Michael Flanagan		
Filing Date	:	March 22, 2004		
Title	:	Ambient Pressure Matrix-Assisted Laser Desorption Ionization (MALDI) Apparatus and Method of Analysis		
Group Art Unit	:	2881		
Examiner	:	Nikita Wells		
Docket No.	:	10980322-4 (12089.4003)		
Customer No.	:	022878		

DECLARATION OF STEVEN M. FISCHER PURSUANT TO 37 C.F.R. § 1.132

MAIL STOP AMENDMENT FEE
Commissioner of Patents
P.O. Box 1450
Washington, D.C. 20231

Sir:

1. My name is Steven M. Fischer. I am a named inventor of patent application serial number 10/806,829 entitled "Ambient Pressure Matrix-Assisted Laser Desorption Ionization (MALDI) Apparatus and Method of Analysis." This application generally describes the first implementation of matrix-assisted laser desorption ionization of analytes at ambient pressure, and describes the ability to perform MALDI on an analyte in solution without adding any matrix to the solution.

2. I received a Chemistry degree from California State Hayward University in 1981.

3. I am Senior Research and Development Chemist at Agilent Technologies Inc. where I have worked for 23 years. I have 17 years of experience in mass spectrometry and 12 years of specific experience in laser-induced ionization of analytes present in a matrix.

4. I have over forty patents related to LC/MS hardware, software and chemistry and approximately ten peer reviewed publications. In 1998, I was working extensively in the field of mass spectrometry and am familiar with the state of the art based on my own work and also from reading literature in the field, attending conferences, working with customers and other activities.

5. I have read U.S. patent 6,683,300 to Doroschenko and the patent claims that describe the use of matrix-assisted laser desorption/ionization of an analyte in solution without the use of an added matrix. I have also read the Office Action from the United States Patent Office sent February 25, 2009. I have considered whether or not one skilled in the art of chromatography and mass spectrometry in 1998 would determine from the content of our patent specification that we possessed and described a method of performing MALDI on an analyte in a liquid solution without any added matrix.

6. Our patent application describes the development of new ionization techniques and ion sources for mass spectrometry that work with flowing chromatographic systems such as HPLC, LC or GC. The development of ion sources that are compatible with chromatography result in more useful analytical techniques. Electron Impact (EI) and Chemical Ionization (CI) ion sources are successful GCMS sources because they easily interface to GC. We successfully demonstrated that AP-MALDI would work with water and a Infrared (IR) laser and that the ion source could be used with an HPLC or CE. We describe this in our application at pages 10-11 of our application where we describe the direct connection between these chromatography apparatus and a mass spectrometer. Water is the most common solvent used in HPLC, and

successfully making ions from water would mean that flow MALDI could be performed on HPLC separations using water without the addition of anything else. This capability is described in detail in our application where the laser energy applied directly to the analyte in solution. See pages 10-12. All of these techniques and capabilities would demonstrate to one skilled in the art that MALDI could be performed directly on the analyte in solution without added matrix.

7. Our application also says in plain text of the document to use a laser to irradiate a liquid analyte solution without an additional matrix for at least the following reasons:

a) The "matrix" described in our application is any substance that absorbs a photon and subsequently transfers charge to an analyte. We describe performing MALDI directly on a liquid solution by directing the laser to the effluent from a chromatography apparatus. The specification states:

> "Flowing" refers to a liquid sample or matrix which is moving and from which the sample and matrix is analyzed.
>
> "Holder" also refers to an interface for introducing a moving liquid e.g. the effluent from a HPLC or CE a syringe pump and the like.
>
> See application at page 10.

b) the application discloses the ability to perform MALDI on an analyte in a water-based solution using IR (infrared laser). This description is in the context of a chromatographic system where the laser is directed to the chromatographic effluent to ionize the analyte in solution. Water is the most common solvent for chromatography and we specifically describe using water as the matrix element without any additional matrix. The portions of our application that describe this are as follows:

> ""Matrix" refers to any solid or liquid molecules having the ability to transfer or receive a charge from the analyte and an absorption of the wave length of the laser ....
>
> * * *
>
> For an infrared laser, aliphatic organic compounds, hydrocarbons, aliphatic organic compounds which contain heteroatoms such as oxygen nitrogen, sulfur, and combinations thereof, water and combinations of these compounds which can transfer to or receive a charge from the analyte are suitable. Application page 11. (emphasis added)
>
> ***
>
> The analyte matrix may be a liquid such as water or alcohol e.g. methanol, or a solid such as ice.
>
> Application page 13.

c) consistent with ordinary usage, the application defines the matrix as performing the function of absorbing laser energy and transforming the charge to the analyte. In our application, the liquid containing the analyte acts as the matrix and no additional matrix is used. The absence of additional matrix is clearly shown in the application where we describe the use of the solvent as the matrix and instruct the use of a laser that is appropriate to the solvent. In other words, we specifically teach to match the solvent to the laser because the solvent acts as the matrix, for example, an IR laser is used for water, and a UV laser is used with acetone. The laser wavelength is based on the solvent because the solvent is acting as the matrix and no additional matrix is necessary or useful. The fact that we specifically tell the MALDI practitioner to match the laser with the analyte solution means that we are describing performing the MALDI technique on an analyte in liquid solution without added matrix. The application states:

> "Matrix" refers to any solid or liquid molecules having the ability to transfer or receive a charge from the analyte and an absorption at the wavelength of the laser, such as ultraviolet (UV), (electronic), visible (VIS) or infrared (IR) (vibrational and/or rotational) or combinations thereof. For an ultraviolet laser,

substituted aromatic compounds are used which can transfer or receive a change to or from the analyte. For an infrared laser, aliphatic organic compounds, hydrocarbons, aliphatic organic compounds which contain heteroatoms such as oxygen, nitrogen, sulfur, and combinations thereof, water and combinations of these compounds which can transfer to or receive a charge from the analyte are suitable.

Specification page 11.

8. I, the undersigned, being hereby warned that willful false statements made herein are punishable by fine or imprisonment or both under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon, do hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true.

Date: 8/21/2009

By: _____
Steven M. Fischer

LEXSEE 30 USPQ2D 1234

Ex parte Robert E. Parks and Robert L. Marietta

Application filed May 31, 1991, Serial No. 708,810, which is a continuation of Serial No. 340,540, filed April 18, 1989, abandoned, for the reissue of Patent No. 4,018,562, granted April 19, 1977, based on application Serial No. 625,510, filed October 24, 1975. Chemiluminescent Nitrogen Detection Apparatus and Method.

Primary Examiner - Jill Johnston.

Board of Patent Appeals and Interferences

1993 Pat. App. LEXIS 27; 30 U.S.P.Q.2D (BNA) 1234

July 15, 1993, Heard
September 2, 1993, Decided
January 4, 1994, Released

[*1]

Before Calvert, Vice Chairman, and Steiner and Tarring, Examiners-in-Chief.

OPINIONBY: STEINER

OPINION:

Steiner, Examiner-in-Chief.

This is an appeal from the final rejection of claims 1 through 10, 20 through 22 and 55 through 106, all the claims in this application for reissue of Patent No. 4,018,562 (the '562 patent).

THE INVENTION

The claimed invention is a method for determining the nitrogen content of a sample comprising manipulative steps which include decomposing the sample in an oxygen/inert gas atmosphere at an elevated temperature to obtain nitric oxide and causing the generated nitric acid to undergo a chemiluminescent reaction with ozone.

Claims 1, 81 and 94 are illustrative and read as follows:

1. The method for determining the total chemically combined nitrogen content of a sample comprising the steps:

a. decomposing said sample in one step in the presence of an oxygen-rich atmosphere of oxygen and an inert gas and at a temperature sufficiently above 700 degrees C. that substantially all of the chemically bound nitrogen is recovered as nitric oxide (NO), such decomposition being conducted in the absence of a catalyst,

b. causing the nitric oxide produced bysuch decomposition **[*2]** to undergo a chemiluminescent reaction with ozone, and

c. determining the magnitude of the chemiluminescent reaction to indicate the quantity of chemically combined nitrogen in said sample.

81. A method for determining the total chemically combined nitrogen content of a sample, said method comprising the steps of:

(a) decomposing said sample in one step, said decomposing step consisting essentially of decomposing said sample in the presence of an oxygen-rich atmosphere of oxygen and an inert gas and at a temperature sufficiently above 700 degrees C that substantially all of the chemically bound nitrogen is recovered as nitric acid (NO);

(b) causing the nitric oxide produced by such decomposition to undergo a chemiluminescent reaction with ozone; and

(c) determining the magnitude of the chemiluminescent reaction to indicate the quantity of chemically combined nitrogen in said sample.

94. A method for determining the total chemically combined nitrogen content of a sample, said method comprising the steps of:

(a) decomposing said sample in one step in the presence of an oxygen-rich atmosphere of oxygen and an inert gas and at a temperature sufficiently **[*3]** above 700 degrees C that substantially all of the chemically bound nitrogen is recovered as nitric oxide (NO) according to the formula:

R - N + O[2] --> CO[2] + H[2]O + NO

(b) causing the nitric oxide produced by such decomposition to undergo a chemiluminescent reaction with ozone; and

(c) determining the magnitude of the chemiluminescent reaction to indicate the quantity of chemically combined nitrogen in said sample.

THE REJECTIONS

Claims 1 through 10, 20 through 22 and 55 through 80 stand rejected under the first paragraph of *35 U.S.C. 112* for lack of adequate descriptive support. Claims 81 through 106 stand rejected under *35 U.S.C. 251* in that they are broader than the originally patented claims. n1 In addition, all the appealed claims stand rejected under *35 U.S.C. 251* for lack of the requisite "error."

n1 The ultimate paragraph of *35 U.S.C. 251* reads as follows:

> No reissued patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent.

The rejection under the first paragraph of *35 U.S.C. 112,* the rejection of claims 94 through106 under *35 U.S.C. 251* as broader **[*4]** than the original claims, and the rejection of all the appealed claims under *35 U.S.C. 251* for lack of the requisite "error" are reversed; the rejection of claims 81 through 93 under *35 U.S.C. 251* as broader than the original claims is affirmed.

OPINION

The Rejection of Claims 1 through 10, 20 through 22 and 55 through 80 under the first paragraph of *35 U.S.C. 112.*

The initial burden of establishing a prima facie basis to deny patentability to a claimed invention on any ground is always upon the examiner. *In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).* In rejecting a claim under the first paragraph of *35 U.S.C. 112* for lack of adequate descriptive support, it is incumbent upon the examiner to establish that the originally-filed disclosure would not have reasonably conveyed to one having ordinary skill in the art that an appellant had possession of the now claimed subject matter. *Wang Laboratories, Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).* Adequate description under the first paragraph of *35 U.S.C. 112* does not require literal support for the claimed invention. In *re Herschler, 591 F.2d 693, 200 USPQ* **[*5]** *711 (CCPA 1979); In re Edwards, 568 F.2d 1349, 196 USPQ 465 (CCPA 1978); In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).* Rather, it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an appellant had possession of the concept of what is claimed. *In re Anderson, 471 F.2d 1237, 176 USPQ 331 (CCPA 1973).*

The examiner contends that the rejected claims lack adequate descriptive support because there is "no literal basis for the" n2 claim limitation "in the absence of a catalyst." Clearly, the observation of a lack of literal support does not, in and of itself, establish a prima facie case for lack of adequate descriptive support under the first paragraph of *35 U.S.C. 112. In re Herschler, supra; In re Edwards, supra; In re Wertheim, supra.*

n2 See page 4 of the Answer, second full paragraph, line 4, and page 7 thereof, last two lines.

The examiner notes that in *Parks v. Fine, 773 F.2d 1577, 227 USPQ 432 (Fed. Cir. 1985),* involving the claimed subject matter, the limitation "in the absence of a catalyst" was considered material. Suffice it to say, no issue under the first paragraph of **[*6]** *35 U.S.C. 112* for lack of adequate descriptive support for the limitation "in the absence of a catalyst" was before the court.

We are not unmindful of the decision in *Ex parte Grasselli, 231 USPQ 393 (Bd.App. 1983)* aff'd mem., *738 F.2d 453 (Fed. Cir. 1984),* which involved claims to a process for the ammoxidation of propane or isobutane employing a catalyst "free of uranium and the combination of vanadium and phosphorus." Under the particular facts in that case, it was held that the negative limitation introduced new concepts in violation of the description requirement of the first paragraph of *35 U.S.C. 112,* citing *In re Anderson, supra.* In the situation before us, n3 it cannot be said that the originally-filed disclosure would not have conveyed to one having ordinary skill in the art that appellants had possession of the concept of conducting the decomposition step generating nitric acid in the absence of a catalyst. See, for example, column 5 of the '562 patent, first paragraph, wherein FIG. 4 is discussed. Pyrolysis temperatures of between 600 degrees C and 700 degrees C, and above 700 degrees C were employed to achieveconversion of chemically bound nitrogen **[*7]** to nitric oxide. Smooth conversion was obtained above 700 degrees C, while the optimum conversion was found to occur above 900 degrees C. Throughout the discussion which would seem to cry out for a catalyst if one were used, no mention is made of a catalyst. n4

n3 Whether the requirement for an adequate written description has been met is a question of fact and, hence, driven by the exigencies of each case. *Wang Laboratories, Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).*

n4 A "catalyst" normally functions to accelerate a particular reaction. See for example, Hawley, Condensed Chemical Dictionary, Tenth Edition, 1981, pp. 205 and 206, copies of which are enclosed for appellants' convenience and made of record.

Moreover, according to two declarations by Wentworth, a professor of chemistry at the University of Houston, whose expertise in this particular art has not been challenged, one having ordinary skill in the art would have recognized that the reaction generating nitric oxide, according to the equation disclosed in the '562 patent, is conducted without a catalyst. See *Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 19 USPQ2d 1111 (Fed.* **[*8]** *Cir. 1991); In re Lemin, 364 F.2d 864, 150 USPQ 546 (CCPA 1966).* Thus, it cannot be said that the originally-filed disclosure would not have conveyed to one having ordinary skill in the art the concept of effecting decomposition at an elevated temperature in the absence of a catalyst. *In re Anderson, supra.*

Accordingly, the examiner's rejection of claims 1 through 10, 20 through 22 and 55 through 80 under the first paragraph of *35 U.S.C. 112* for lack of adequate descriptive support is reversed.

The Rejection of Claims 81 through 106 under *35 U.S.C. 251* as Broader than the Original Claims.

We initially observe that on page 6 of the Brief,

appellants agree that any claim in the reissue application that does not contain a limitation that means "in the absence of a catalyst" is broader than original claims 1-10 and hence unpatentable under *35 USC 251* (appellants' emphasis).

Claims 81 through 106 do not contain a negative limitation which expressly precludes the presence of a catalyst. However, appellants contend that claims 81 through 93 exclude the presence of a catalyst by virtue of the phrase "consistingessentially of" in characterizing the decomposition step, **[*9]** and that claims 94 through 106 exclude the presence of a catalyst by virtue of the recited equation for the decomposition reaction, which equation does not reflect the presence of a catalyst.

In our opinion, the phrase "consisting essentially of," as employed in claims 81 through 93, limits decomposition to a single step and, in that sense, is redundant since decomposition is performed "in one step." However, it is not apparent and appellants have not explained why the expression "consisting essentially of" excludes the presence of a catalyst during the recited decomposition step. n5 It would, therefore, appear that claims 81 through 93 are broader than original

claims 1 through 10 and, hence, were properly rejected by the examiner under *35 U.S.C. 251.* Accordingly, the examiner's rejection of claims 81 through 93 under *35 U.S.C. 251* is affirmed.

n5 Compare *Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 229 USPQ 805, 812,* note 6 (Fed. Cir. 1986).

Claims 94 through 106 recite the decomposition reaction in a manner which, according to the Wentworth declarations, means that no catalyst was employed. *In re Lemin, supra.* Accordingly, claims 94 through 106 would not **[*10]** appear broader than original claims 1 through 10 and, hence, the examiner's rejection of claims 94 through 106 under *35 U.S.C. 251* is reversed.

The Rejection of the Appealed Claims Under *35 U.S.C. 251* for Lack of the Requisite Error.

This rejection is reversed essentially for the reasons advocated by appellants on appeal. We emphasize that the practice of submitting claims as a hedge against the possible invalidity of original claims has been judicially sanctioned. See, for example, *Hewlett-Packard Co. v. Bausch & Lomb, Inc., 882 F.2d 1556, 11 USPQ2d 1750 (Fed. Cir. 1989); In re Altenpohl, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974); In re Handel, 312 F.2d 943, 136 USPQ 460 (CCPA 1963).*

In summary, the examiner's rejection of claims 81 through 93 is affirmed; the rejection of claims 1 through 10, 20 through 22, 55 through 80 and 94 through 106 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR 1.136(a). See the final rule notice, *54 F.R. 29548 (July 13, 1989), 1105 O.G. 5* (August 1, 1989).
AFFIRMED-IN-PART

Legal Topics:

For related research and practice materials, see the following legal topics:
Patent LawInequitable ConductGeneral OverviewPatent LawU.S. Patent & Trademark Office ProceedingsExaminationsGeneral OverviewPatent LawU.S. Patent & Trademark Office ProceedingsInterferencesGeneral Overview

RELATED PROCEEDINGS APPENDIX

As stated in the *Related Appeals and Interferences* section above, there are no other appeals or interferences known to Appellants, the undersigned Appellants' representative, or the assignee to whom the inventors assigned their rights in the instant case, which would directly affect or be directly affected by, or have a bearing on the Board's decision in the instant appeal. As such this section is left blank.